Irrigation Crop Diversification Corporation

ANNUAL REPORT 2005/06

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Objects and Purposes of ICDC – *The Irrigation Act, 1996*

The objects and purposes of ICDC are the following:

- to research and demonstrate to producers and irrigation districts profitable agronomic practices for irrigated crops;
- to develop or assist in developing varieties of crops suitable for irrigated conditions;
- to provide land, facilities and technical support to researchers to conduct research into irrigation technology, cropping systems and soil and water conservation measures under irrigation and to provide information respecting that research to district consumers, irrigation districts and the public;
- to co-operate with SIPA and the Minister in promoting and developing sustainable irrigation in Saskatchewan.

Irrigation Crop Diversification Corporation

Board of Directors

The following served as Directors of ICDC in 2005:

Name	Position	Irrigation District	Development Area Represented	Election Year (#terms)
Carl Siemens	Chairman	Rush Lake ID	SWDA	'05 (2)
John Könst	Vice Chair	SSRID	LDDA	'05 (2)
Rick Swenson	Alt. Vice Chair	Baildon ID	SEDA	'06 (1)
Kevin Plummer	Director	Moon Lake ID	NDA	'06 (1)
Vacant	Director		SWDA	'07 (1)
Randy Bergstrom	Director	Luck Lake ID	LDDA	'07 (1)
Francis Kinzie	Director	Pike Lake	Non-District	'06 (1)
Kelvin Bagshaw	Director	Luck Lake ID	SIPA rep.	app.
Larry Lee	Director	Macrorie ID	SIPA rep.	app.
Scott Wright	Director		SAF rep.	app.
John Linsley	Director		SAF rep.	app.

The Four Development Areas are: Northern (NDA), South Western (SWDA), South Eastern (SEDA) and Lake Diefenbaker (LDDA) as defined in ICDC's bylaws.

ICDC Directors are elected by District Delegates to the Annual Meeting. Each Irrigation District is entitled to send one ICDC Delegate per 5,000 irrigated acres or part thereof. Two Directors are elected from LDDA, two from SWDA, and one each from NDA and SEDA. Non-District irrigators elect one representative. The Saskatchewan Irrigation Projects Association (SIPA) and Saskatchewan Agriculture and Food (SAF) appoint two directors each to the ICDC board. The ICDC board must, by law, have irrigators in the majority.

Staff 2005

By agreement, agrologist and administrative services are provided to ICDC by SAF.

Les Bohrson PAg	ICDC Senior Agrologist	Swift Current
Korvin Olfert PAg	ICDC Agrologist	Swift Current
Lana Shaw PAg	ICDC Agrologist	Outlook
Clint Ringdal PAg	ICDC Agrologist	Oultook
Frances Thauberger AAg	ICDC Agronomy Assistant	Swift Current
Marlene Knopp	ICDC Administration	Outlook
Janice Bennett	ICDC Administration	Outlook

ICDC, Box 609, OUTLOOK SK S0L 2N0 (306) 867-5527

Irrigation Crop Diversification Corporation

Letter of Transmittal

Outlook, Saskatchewan
June 26th 2006
To Her Honour
The Honourable Linda Haverstock
Lieutenant-Governor of the Province of Saskatchewan

Your Honour:

I have the honour to submit herewith the Annual Report of ICDC (Irrigation Crop Diversification Corporation) for the year 2005/06, including the financial statement audited by Lois A. Johnson CMA, all in accordance with *The Irrigation Act, 1996.*

Respectfully submitted by

Rick Swenson
Chairman
ICDC

Irrigation Crop Diversification Corporation

ICDC STRATEGIC PLAN (2004)

Vision: *Through Innovation, The Irrigation Crop Diversification Corporation stimulates and services the development and expansion of sustainable Irrigation in Saskatchewan*

Objective 1: Strengthen the linkages in profitability and risk between production capacity, processing and market opportunities.

1A) Develop a 'gap-analysis' process to identify market opportunities for branded and commodity products from irrigated production systems.
1B) Partner with SAF in the identification of key supports required to move market opportunities forward.
1C) Partner to facilitate and offer service for formation of Co-op, marketing alliances and other strategic services for the development of irrigation expansion and sustainability.

Objective 2: Enhance the production of profitable, sustainable irrigation based crop and livestock products.

2A) Sustain and grow the partnerships with the Agriculture and Agri-Food Canada, Producers, and SAF for the delivery of economic and agronomic packages for market oriented irrigated crop and livestock production systems.
2B) Establish an Irrigation Knowledge Network that captures and validates best management practices, knowledge and experience in irrigation from across the Great Plains and makes it available to Saskatchewan growers and industries.
2C) Expand targeted partnerships on the development of crop varieties for irrigated cropping systems.

Objective 3: Create a public awareness of the economic, social and environmental returns to investment in irrigation

3A) Establish the Saskatchewan benchmark for the state of Environmental Sustainability opportunities arising from water development, and irrigated agriculture.
3B) Establish and Communicate the Saskatchewan Benchmarks for the economic impact of irrigation to Saskatchewan.
3C) Develop a Communication Package that explores the competitive advantages for Irrigated Products from Saskatchewan, and targets potential processing, and market opportunities.

Objective 1. Strengthen the linkages in profitability and risk between production capacity, processing and market opportunities.

- **Saskatchewan Irrigated Vegetable Crop Competitive Analysis**

A steering committee was established to do a competitive analysis study for irrigated crops. The committee included ICDC, The Food Centre, SAF's Crop Business Unit, The Canada Saskatchewan Irrigation Diversification Centre and SAF's Outlook Ag Business Centre.

After reviewing several categories of crops to consider for competitive analysis study, the category "vegetables" was selected. "Vegetables" offer irrigation opportunity, data is available even though a lot of work is required to assemble it and gaps exist, "vegetables" is not well developed. Competitive issues arise between local producers and increased local production but will not significantly impact price (as it does with niche market crops).

Vegetables
The Saskatchewan vegetable industry has growth potential. What is the real potential that exists and where are Saskatchewan's competitive advantages?

We can take advantage of our image as a "pure" environment and enter the organic vegetable market in a larger capacity. There may be a niche market opportunity with "heritage" vegetables. There may be potential in vegetable processing which can include canning or bagging and freezing.

What are the challenges?

- Saskatchewan banks are not equipped to finance vegetable production equipment.
- Successful operations are usually third generation farms and few Saskatchewan residents have commercial vegetable growing experience.
- A quota system that regulates supply may need to be set up as in Manitoba.
- We have to fill labor shortages, possibly with migrant seasonal workers.
- A central organization with solid leadership must be in place. This organization must ensure a six month supply of produce to retailers to be competitive.
- Supportive policies and programs may be required by government.
- There is a lack of marketing skill amongst Saskatchewan growers.
- There is not a large food service market and restaurants do not like to deal with a supplier that can only supply a few items.

What are the next steps?
- Identify gaps in the market place and find out who needs our production.
- Meet with local processors and retailers to discuss local supply options.
- Try to attract experienced vegetable producers from outside Saskatchewan and Canada.

- Assess feasibility of one centralized storing and packing facility.
- Consider single desk selling.
- Explore niche markets and target specific clients.
- Explore supporting policies and programs and financial requirements.
- Advertise key market garden areas.
- Expand our migrant worker population and availability.

Details of the vegetable data, consumer trends and challenges are included in the steering committee report along with recommendations and actions.

- **Investment Attraction**

The opportunity for irrigation expansion exists in Saskatchewan with underutilized infrastructure (eg. the Gardiner Dam), untapped water and adjacent irrigable land, and an aging generation of farmers looking to retire in the next ten years. Furthermore, ICDC understands that irrigation water on the North American continent is depleting and pumping costs are becoming more expensive, in the case of groundwater; water is being bid away from agriculture by urban and environmental interests in the case of both ground and surface water. The opportunity to attract investment and immigration to new irrigated areas with reliable and relatively inexpensive land and water is increasing.

SAF has been involved in immigration attraction to the hog and dairy industry and to farming in Saskatchewan through the Saskatchewan Immigrant Nominee Program. ICDC has been able to add irrigation to the province's immigration attraction portfolio. Real Estate Companies and consultants are active in immigration attraction to Saskatchewan. The Last Cattle Frontier initiative in the Yorkton area has targeted immigration from Alberta. See www.lastcattlefrontier.com .

ICDC is working with SAF, the Saskatchewan Immigrant Nominee Program and with MidSask REDA around Lake Diefenbaker to align its resources for investment attraction and immigration. SIPA's and ICDC's website www.irrigationsaskatchewan.com is being upgraded and redesigned to provide the information required by prospective investors and immigrants. Discussions are held regularly with prospective immigrants and with immigrant agencies.

Since 2000 approximately 5% of the irrigated land around Lake Diefenbaker has been purchased by people moving from Alberta. This trend will continue and grow if irrigation "infill" and expansion plans currently being studied under The Canada Saskatchewan Water Supply Expansion Program are implemented.

ICDC continues to develop an investment attraction and immigration strategy.

- **The Prairie Irrigated Crop Diversification Group (PICDG)**

Irrigation has many common interests in the three Prairie Provinces. Research and demonstration (R&D) resources are limited and collaboration between provinces will help to avoid duplication of studies and "reinventing the wheel".

ICDC has been instrumental in keeping this group active. A new Memorandum of understanding (MOU) has been prepared to reflect today's R&D priorities. Parties to this MOU are;

- The Canada-Manitoba Irrigation Diversification Centre.
- The Canada-Saskatchewan Irrigation Diversification Centre (including ICDC as industry co-chair).
- The Canada-Alberta Crop Development Initiative and the Crop Diversification Centre South.

The purpose of the MOU is to assist the irrigation industry across the prairies to address economic and environmental issues through;

- The sharing of information on research and development initiatives
- The identification and development of joint projects
- The exploration of joint funding opportunities
- The enhancement of joint visibility through a shared communications plan
- The provision of a mechanism for addressing operational issues that impact on cooperation and
- The coordination of prairie-wide conferences, seminars and workshops.

You will find access to irrigation information from all three prairie provinces on ICDC's website www.irrigationsaskatchewan.com and one of the priority items for this group is to make sure that all irrigation-relevant information is made accessible. This will be an on-going effort.

ICDC is already involved in joint projects on

- Corn
- Timothy
- Potatoes
- Forage varieties
- On-line weather-based irrigation scheduling (www.imcin.net)
- irrigation's impact on the environment in order to pro-actively respond to the processor and consumer demand for food safety and security

ICDC supports The Prairie Irrigated Crop Diversification Group and its push for collaboration on irrigation R&D between the three Prairie Provinces. ICDC will increase access to information via this group through www.irrigationsaskatchewan.com . The Prairie Irrigated Crop Diversification Group is very much aligned with ICDC's mission of *"value for money R&D"*.

Objective 2. Enhance the production of profitable, sustainable irrigation based crop and livestock products

- **Irrigation Management Climate Information Network**

ICDC continued working with Alberta Agriculture's Irrigation Division staff to field check a decision support system based on climate data. This system, known as Irrigation Management Climate Information Network, (IMCIN) utilizes the nearest meterological station data to assist with irrigation scheduling. The meterologic (met) data is used in the Alberta Irrigation Management Model, AIMM, and with input by the producer helps determine appropriate times for irrigating. The model requires input on seeding date and beginning soil moisture content. It then tracks moisture use based on the met data. The moisture use curve can be corrected to measured values if desired throughout the season. AIMM will also predict moisture use for an upcoming period based on historic record for the selected met site. This allows a producer to forecast an irrigation requirement.

Irrigated crops were monitored for moisture use utilizing tensiometers, rainfall and irrigation rain gauges, gravimetric soil moisture, and in field moisture determination by the feel method. Irrigation timing and amounts were controlled by the co-operator and the water use tracked with the model.

The 2005 growing season, although better than 2004, was again challenging. Overall the AIMM program provided reasonable agreement with what we saw for consumptive use in the field. There were differences with some sites slightly over or under estimating use. These differences could be due to the soil texture profiles chosen to run in the program (something for which we need to gain a better understanding) or possibly from errors in the model due to another relatively cool year. We will continue to collaborate with our counterparts in Alberta and are working to see more Saskatchewan stations added for 2006. This would allow producers in other parts of the province to use the program and assist them with their irrigation decisions. Take the time to check out the IMCIN web site located at www.agric.gov.ab/app49/imcin/index.jsp to learn more about this powerful tool.

- **Average Corn, in the "Anything but Average 2005"**

Crop Insurance offered the second year of a 2100 corn heat unit (CHU) pilot project covering from North Battleford to Indian Head to Empress. Their 2005 liability is small with only four of twelve weather stations being marginally below 2100 CHU.

ICDC's 2005 corn demonstration included forty fields with thirteen varieties ranging from early 2100 CHU to full season 2450 CHU varieties.

Corn grain samples, collected, shelled and analyzed at mid September, indicated that 41 pounds per bushel and 83% TDN would be typical. The average grain yield estimate of 74 bu/ac dropped from 80 bu/ac in 2003 but was much improved over 38 bu/ac in 2004. The corn silage results describe the relative grain fraction. Great corn cob development

propels corn silage well past the optimum cereal silage in total digestible nutrients. However in 2005, our corn plants were relatively bigger in dry matter than the cobs. Yields ranged from 11 to 19 tons per acre with an average yield of 13.5 tons per acre at 65% moisture. Corn heat unit accumulation through the 2005 growing season roughly ended about normal to 100 CHU or 4% short of the long term average on the northern prairies. Corn silage quality and yield reflected a small short fall. On a dry matter basis, our corn silage objective is to deliver over 70% TDN. Corn silage averaged 67% TDN up from 63% TDN in 2004.

For the third year the Alberta Corn Committee (ACC) tested both grain and silage corn varieties at CSIDC in Outlook (2300 CHU). These tests also located at Bow Island (2400 CHU), Vauxhall (2300 CHU), Brooks (2250 CHU), Lethbridge (2100 CHU) and Lacombe. Canadian Corn Companies paid $128.00 for each entry. Sponsors include: Advanta Seeds (Garst hybrids), Dow AgroSciences Canada (Mycogen hybrids), Hyland Seed, MTI, Maizex Seeds, Monsanto Canada (Dekalb hybrids), Pride Seeds, Quebec Federated Coop (Elite hybrids), Pickseed Canada, PIONEER HI-BRED, and Syngenta Seeds Canada (NK and Funks hybrids). Silage entries were harvested for whole plant yield and moisture content. Grain varieties were harvested for grain yield, moisture content and test weight. In both cases, great cob development is required to deliver top results. The corn heat unit rating of the 36 corn entries was from 2150 to 2700 CHU. This range brackets the coolest to warmest summers experienced at Outlook in the last forty years. Brian Beres, heads the Agronomy Unit, Lethbridge Research Centre, and is the Corn Hybrid Trial Coordinator for the Alberta Corn Committee and Terry Hogg supervised the corn at CSIDC in Outlook.

CSIDC topped all the ACC corn test sites in 2003, but is positioned in the middle of the 2004 results. This ACC trial was the starting point for the September 13th Saskatchewan Fall Crops Field Day. The silage plots averaged 18 tons per acre and the grain plots averaged 90 bu/ac.

CSIDC and SPARC hosted the ACC "Minor Use Registration Initiative – Liberty 200SN for corn". A testing protocol for weed control efficacy and crop tolerance was coordinated by Doug Billett, SAF Production Technology Manager. The results were favorable and registration became official on August 30, 2005 as is the case already in B.C., Manitoba and Ontario. Four companies have at least a dozen Liberty Link corn varieties for the Saskatchewan market.

- **Osler Dairy Forage Center**

In the spring of 2003, a randomized replicated trial was established at Osler with 14 different varieties of alfalfa and 14 different varieties of grasses. The purpose of this trial was to highlight the potential production of forages under irrigation with an intensively managed system and to compare how the varieties responded to this intensive management. Much of the forage information currently available is collected from plots with less intensive management (1 or 2 cuts) while the dairy hay producers typically utilize 3 cuts. The purpose of this plot was to demonstrate the potential of irrigated land to supply feed for the local dairy industry. The soil at this site is a sandy loam with irrigation from the South Saskatchewan River. This site was cut three times during 2004

(June 22, Aug 5, and Oct 6) and three times during 2005 (June 24, Aug 10, Oct 6). No data was collected from the third cut in 2005 due to a scheduling error.

Fertility started in the spring with 100 lbs actual N on the grasses, and 50 lbs actual P over the whole plot. The alfalfa also received 23 lbs actual N from the P application. After first and second cut, the grass was fertilized again with 100 lbs actual N. Yield results and quality analysis were compiled for 2005 for the alfalfas and the grasses.

Alfalfa Results: Most of these varieties are tap rooted varieties which out yield creeping rooted varieties under hay production, although there are a few varieties with a branched tap root. Creeping rooted varieties are more suited for pasture as they tolerate trampling better. As expected there was not a huge difference between the top 11 varieties. These include the top varieties of a number of seed companies. They are all high yielding and quite fast re-growing. The average RFV (Relative Feed Value) for first cut was 143, with second cut much higher at 170. Third cut would have been similar to the second cut. In retrospect, first cut could have been taken earlier in order to get higher quality. Beaver was included in the trial as a standard for comparison as it has been for many years. Beaver is quite winterhardy however, winterkill was noticed in some of the plots. Beaver did very well this year. It is not as quickly regrowing as some of the other varieties. A third cut would perhaps have allowed the other varieties to overtake Beaver.

Overall the alfalfa performed well. With only two cuts the average yield was 2.58 t/a, but a third cut would have added about 1.3 t/a to bring the average up to about 3.88 t/a. This was lower than last years average of 5.24 t/a. There was some evidence of winterkill, with some winter annual weeds showing up in the empty spaces.

Grass Results: In the past, grass has not usually been recommended under intensive irrigation as it is generally lower yielding and always lower quality compared to alfalfa. When recommended, it was usually in a mix with alfalfa to lengthen the life expectancy of the stand. However in these plots, several grasses out yielded the alfalfa.

For variety recommendations, please check the "Crop Varieties for Irrigation, 2006" published by ICDC and CSIDC. All of the data presented in this article is included in the dataset used for that publication.

Special Thanks goes to Peter J. Fehr who generously supplied the land for this plot.

- **Alfalfa Demonstration at Swift Current**

The purpose of this demonstration was to highlight the production capability of alfalfa under a two cut system destined for the beef market. It is an excellent example of the interdependence of the beef industry on the crops/forage industry and irrigation as a tool to enhance that. It was located north east of Swift Current. This field scale demonstration was established in the spring of 2003 with seven of the top varieties from two seed companies (Proven Seed and Pioneer) seeded at 12 lbs/acre. Quarter meter squares were taken on July 6th and August 26th to get a measure of the maturity at each cut. Bales were

counted, weighed, and samples were taken for quality analysis. First cut was harvested July 16th, late due to continuing rain, and second cut was taken Sept 9th. These were not randomized or replicated.

This demonstration shows the high yields that can be achieved under irrigation. With a two cut system you can get similar yields to three cuts, although the quality is more suited for a beef cow rather than a dairy cow.

Special Thanks goes to Jeff Wiebe for the generous use of his land.

- **SeCan Cereal Forage Demonstration**

Currently cereals are grown on 27% of the intensively irrigated acres around Lake Diefenbaker. They are grown either as a cash crop in a rotation, or as silage for cattle feed. Increasing the GDP of these acres requires moving to more profitable crop based products, or to optimize the feed/animal linkage. Two demonstrations were established to promote these goals, one at Baildon and the other at Osler. Both had similar irrigation scheduling and fertility. They were three hard red spring wheat, a CPS wheat, two soft white wheat, a durum, two flax, two oat, one triticale, and eight barley varieties included.

- **Red Fife and Marquis Wheat Demonstration**

In honor of Saskatchewan's Centennial year, ICDC seeded two 100-year-old wheat varieties in the variety trials at Baildon and Osler – Red Fife and Marquis. Generally the plants were taller and had more kernels per head compared to our current wheat varieties. It was noticeable that Red Fife matured later than Marquis, but it was difficult to see a difference in maturity between Marquis and the other varieties.

Red Fife and Marquis Wheat have an important place in the history of Canadian Agriculture. Red Fife was a variety imported from Eastern Europe and known for excellent baking and milling quality. It was crossed with Hard Red Calcutta, (an early-maturing variety from India), to create the variety known as Marquis. The cross was made in 1903 by Charles Saunders and his brother at a research station in Agassiz, B.C. and was sent to the Indian Head experimental farm for a trial on the Canadian Prairies in 1907. The new variety had a surprisingly high yield. Distribution began in 1909 and by 1915, 80 percent of the 9.8 million tons of wheat harvested in Canada was Marquis. It also made up a large part of production south of the border in the mid-western United States.

As wheat became more common on the prairies, wheat rust became more of a problem. Marquis wheat eventually suffered from a rust epidemic and was replaced by new varieties, many of which are "children" of the famous Marquis wheat. Even so, the contribution this variety made to Canadian agriculture was great. It was responsible for a steep climb in total production and it developed Canada's reputation as a producer of high quality grain. Many of our varieties today are actually descendants of Marquis and Red Fife.

- **Spring cereals under-seeded to three winter cereals and Italian ryegrass**

Under-seeding of spring cereals with winter cereals has been proposed as a way to provide season-long grazing in dryland farming systems. Often though, the regrowth of the winter cereal is sparse following the harvest of the spring cereal mainly because there is little or no moisture reserve. An irrigated system allows us to investigate further the utility of under-seeding spring cereals to winter cereals.

An experiment was designed with three spring cereals, oat cv Pinnacle, triticale cv Pronghorn and barley cv Westford, under-seeded to each of winter rye cv Prima, triticale cv Bobcat, perennial cereal rye cv ACE-1 and Italian ryegrass cv Fabio. The winter cereals and the Italian ryegrass were seeded as mono-cultures as well. The experiment was laid in a randomized complete block design with four (4) replicates and planted in 2003-2005, inclusive.

Dry Matter Yield Performance: For the spring cereals under-seeded to winter cereals and Italian ryegrass, about 90% of the dry matter yield was produced in the first cut. Dry matter yield of the mono-cultures was about the same in each of the first and second cuts and overall amounted to about 6.5 to 7.5 tonnes or 50% of the total production of the spring cereals under-seeded. There was no significant difference in the yield of the four mono-cultures with the exception of perennial cereal rye out-yielding winter rye on average in the first cut. On average, spring triticale significantly out-yielded oat and was not significantly greater than barley.

Crude Protein: Crude protein content in the first cut was significantly greater in the mono-cultures vs the under-seeded treatments. The mono-cultures were different with Bobcat > Prima >Perennial cereal rye = Italian ryegrass. On average, protein content of barley was greater than triticale = oat. Because of these differences in crude protein content, i.e., the high protein levels in the mono-cultures vs the spring cereals, the feeding applications of the mono-cultures should be considered differently than those of the spring cereals. Crude protein content of the second cut was variable and generally over 20%. This likely reflects that at least some of the regrowth was that of the winter cereal and Italian ryegrass and that it influenced the treatments to varying degrees.

Phosphorous Content: There was no significant differences in P content of the mono-cultures which was greater than that of the under-seeded treatments. Like protein content, P content was more variable in the second cut; slightly higher for the under-seeded treatments and lower for the mono-cultures.

Calcium Content: Calcium content of barley was significantly greater than that of oat, triticale or the mono-cultures in cut 1. Generally, oat and triticale contained about 60% and the mono-cultures about 75% as much calcium as barley.

- **Silage Cereal Varieties**

Again in 2005, ICDC agrologists in Swift Current had the opportunity to host a site for the variety trials from CSIDC. They included the barley, triticale and oat trials. By hosting a site off station, CSIDC was able to collect two site years of data in one year. The following are results to be included in the much larger dataset for the "Crop Varieties for Irrigation, 2006" which is used for variety recommendations. ICDC also collected quality information for each of these.

As usual, barley was higher quality than the oats or triticale. Yields were similar between all three, consult "Crop Varieties for Irrigation, 2006" for recommendations.

- **Irrigated Timothy - Phosphorus Rate Trial**

The purpose of this trial is to determine the optimum amount of phosphorus required for irrigated Timothy Production. Phosphate applications were made in 100 lb increments, from 0 to 300 lbs actual Phosphorus, in various combinations over the two years. Nitrogen was constant across the plot at 100 lbs actual N per cut. The timothy was harvested August 27, 2004, July 8, 2005, and Sept 20, 2005.

Last year there was no difference between applying 0 lbs P and applying 300 lbs P to a soil with 32 lbs P already in it. In the second year there was also no detectable difference between applying 300 lbs P in each year vs the check.

- **Irrigated Timothy - Drying Rate**

One of the most difficult problems with growing timothy is the drying process. Hay sealed in shipping containers, sitting for a few months on a ship, has to be around 12% moisture so as not to spoil. In most years it is difficult to get the timothy hay that dry. It all depends on the length of the harvest window and the time between rain showers. It would be helpful if we could predict whether timothy would dry in any particular harvest window. To determine this, ICDC has started a project to estimate the drying rate of timothy hay.

A literature search was completed. Two fields of timothy were sampled near Lucky Lake for two cuts. This provided four cases in which to evaluate the prediction equation. Each case was sampled periodically from the time the field was cut until the field was baled. At each sampling, measurements taken included the hay moisture (twice), the soil moisture (twice), temperature, relative humidity, and wind speed. Any missing weather information was substituted with data from the Environment Canada weather station located at Lucky Lake (12 miles from the fields). Solar insolation values were taken from the weather station at CSIDC in Outlook (30 miles from the fields). Moisture values were determined in the field using the microwave method and were taken from the bottom of the swath. Soil moisture samples were taken from 0-10 cm depth underneath the swath with any organic matter removed.

The average R^2 of the four cases was 0.64, although this varied from 0.39 to 0.98. This preliminary data looks very encouraging and with more years of data, an equation could be developed using Saskatchewan data.

- **Irrigated Timothy - Crop Insurance Pilot Program**

In November 2004, Saskatchewan Crop Insurance was invited to the Irrigation Crop Diversification Corporation timothy hay production seminar and made a presentation to producers and processors in the Outlook area.

These industry representatives were interested in the insurance products Crop Insurance could provide. They believed that timothy hay acres had reached a plateau in Saskatchewan though there was capacity to process more. Acres might increase if there was an insurance program available to offset the high risks in producing this management-intensive crop. These acres were not previously insurable under existing Crop Insurance programs.

Crop Insurance presented information on the New Crops program which provides coverage options on non-traditional crops grown in Saskatchewan and introduces insurance on crops where there is limited historic production information available. Discussions also focused on the cooperation necessary between the corporation, producers and industry to determine production risks and program design options.

The industry representatives including the Canadian Hay Association, the Irrigation Crop Diversification Corporation and area producers returned to Crop Insurance in December of 2004 with the historic information required for a complete risk analysis. Continuing to work with industry representatives, Crop Insurance designed a pilot program to address the production risks of this specialized crop, launching in March 2005.

The Timothy Hay Pilot Program covers irrigated pure timothy hay stands intended for export grown in designated rural municipalities in the Outlook area. Exported to Asia for feed, timothy hay's high quality fibre is desirable for dairy and beef herds. The Outlook area was targeted because of the concentration of producers and processing facilities.

To be marketable, export quality hay must have a good green colour and not contain any weeds or other crop contaminants. Therefore, quality coverage was the key to any timothy hay program introduced. Since these acres are irrigated, yield losses are not considered the crop's primary risk. Under the 2005 pilot program, enrolled acres are covered for one or two-cut coverage for yield and quality losses below the Choice grade.

The program was selected by 15 producers representing almost 7,000 acres of irrigated timothy hay and approximately $ 2.6 million of insurance coverage. Premium contributions were approximately $133,000 from producers and $222,000 from federal and provincial governments.

The pilot was administered out of the Saskatchewan Crop Insurance office in Rosetown, where Crop Insurance staff worked closely with industry to gain familiarity with production practices and to develop adjusting procedures. Adjusters visited customer farms to assess the first and second cut yields and quality. It is projected that claims will be finalized in early December after all grading has been completed.

Crop Insurance will be working closely with producers enrolled in this pilot to gather feedback to further improve the program.

- **Microwave Drying to Determine Moisture Content of Hay**

This year ICDC performed trials using a microwave to determine the moisture content of hay. Overall, the method was successful. It takes about 20 minutes to dry a 100-200g sample from 60% moisture to zero, and the moisture contents obtained were close to those from the drying ovens at the research station in Swift Current. Producers could use this method if they would like to double-check the moisture content of their feed before baling, formulating rations, or making silage. A scale accurate to 1g is needed, and care must be taken not to run the microwave with a dry sample alone or there is risk of fire. It should also be noted that this drying method can produce a strong odor.

To test the accuracy of this method, 14 alfalfa samples were taken from our plots, 7 dried with the microwave and 7 dried with the oven. The samples ranged from 76 to 83% moisture. We were surprised to find the moisture content calculated from microwave-dried samples was 77.6% while the average from the oven-dried samples was 80.1%. This would suggest that the microwave was not drying the samples completely. However, when the 7 microwaved samples were then put in the oven to see if they would dry further, they came out unchanged. Anyone who uses this method should allow for several percentage points of error.

A Protocol for Microwave Moisture Determination was developed.

- **Potato Variety Research**

ICDC contributes in-kind support to an Agriculture and Agri-Food Canada Matching Investment Initiative (MII) for potato novel trait variety research. CSIDC in Outlook conducts potato variety and agronomy research. The MII project is titled Commercial Scale Evaluation of Advanced Clones. There were five advanced clones from the Lethbridge Research Station evaluated for storage and culinary practices. This seed will be utilized for field-scale multiplication in a commercial field.

- **Soybean Variety Testing**

Irrigators as well as producers in general, are looking to diversify their farms with any crops that have potential to add to the farm profits. If the crop can be grown using the current equipment inventory the option is even better. Soybeans are one crop that has been raising questions in Saskatchewan in recent years. A huge world market and

expanding oilseed demand are influencing this interest. Add to this the fact that there are good weed control options (ie. glyphosate tolerant) and soybeans are a crop to be considered.

ICDC has been looking to answer producer's questions on soybeans and has again teamed up with CSIDC to demonstrate the potential of new soybean varieties in Saskatchewan. Terry Hogg of CSIDC has been growing a soybean variety trial at CSIDC for the past two seasons and has demonstrated the large differences in soybean varieties. 2004 was as poor a year as one can expect for soybeans due to the early frost and as a result no varieties provided acceptable yields. One year should not discourage farmers though as many crops commonly grown were also destroyed by the early frost. Six varieties were grown this year on two irrigated sites. 2005 demonstrated how much more suited the early varieties were for Saskatchewan than the longer season varieties. Varieties requiring 2400 heat units or less were generally yielding above 30 bu/ac. Varieties requiring 2450 and higher were generally yielding less than 20 bu/ac.

Look for soybeans to be added to the annual "Crop Varieties for Irrigation" publication when CSIDC collects enough site years to make variety recommendations.

- **Irrigated Variety Testing**

ICDC has continued funding in 2005, to CSIDC for on going variety testing. The results each year are added to a database that consists of close to 15 years of trials and this information is used to produce the annual CSIDC/ICDC publication, "Crop Varieties for Irrigation". In 2005 there were again four ICDC funded sites for flax, canola, wheat and peas. Many other crops are to be added to the database including soybeans, sunflowers, corn, dry beans, alfalfa, timothy, potatoes and annual cereal forages.

- **Dry Bean White Mold Survey**

A survey of white mold severity was taken to determine best management practices for managing this disease in irrigated beans.

The primary purpose of the survey is to find out which factors are most important and to work with bean producers on managing the disease as efficiently and effectively as possible.

ICDC has collected information from dry bean growers regarding their production practices that influence white mold severity. Information about crop rotation, bean variety, row spacing, N fertilizer rate, fungicide application, and yield was collected. Fields were rated for disease severity between Aug 22 and Sept 7. Some fields were rated twice over that period. The goal was to rate them close to maturity – at buckskin stage. Sixty plants were rated in each field and the result is an average rating for the field (0 to 100 scale). In total, 29 fields were included in the survey, which includes most but not all of the irrigated dry bean acres in Saskatchewan.

Fungicide use varied from none to two applications. Some badly diseased fields had been sprayed twice and a few relatively clean fields had not been sprayed at all. It shows that the influence of other factors like rotation, irrigation application, bean variety, and even row spacing are too important to overlook. It is too early in this study yet to conclude what was the most effective or efficient practice for fungicide use.

Two factors were found so far that influenced the severity of white mold in the beans. Variety was one of them – the new upright varieties generally had less white mold than the older prostrate varieties. The other was bean rotation. Fields with short bean rotations (0 or 1 year break between beans) had a higher average Disease Severity Index than those fields with 2 or more years. While there was not a tremendous amount of white mold this year, there was enough disease development to find some interesting differences that could potentially help bean growers to manage white mold more effectively and efficiently.

- **Fusarium and Leaf Disease Survey**

The SAF Provincial Plant Disease Specialist Penny Pearse, and the Crop Protection Lab co-ordinate and produce the Fusarium and Cereal Leaf Disease surveys. The objectives of the survey are to determine the prevalence of FHB (Fusarium Head Blight), to monitor its spread within the province, and to determine the *Fusarium* species responsible. ICDC agrologists have included irrigated acres in the survey for the past three years. In 2005, SK Crop Insurance adjustors and ICDC Agrologists collected heads from commercial wheat, durum, barley and oat fields during the early dough stages of development.

The average FHB severity for irrigation in Saskatchewan was 0.2%, which is comparable to the provincial average. In 2005, 23 cereal fields were surveyed in irrigated areas from Bradwell to Consul, including 15 fields of wheat, 6 fields of barley and 2 fields of oats. Fourteen of the 23 fields were found to have some amount of FHB, but the severity of infection was generally negligible. The FHB severity value, which is the percentage of infected kernels in the collective grain sample, ranged from 0 to 2.4 % infected kernels. The field with the highest severity was durum, but some durum fields also had no infection. Some of the barley samples had FHB, and the two oat samples were clean. In 2005, *F. graminearum* was found in six of the 23 irrigated fields surveyed, including four fields of wheat and two fields of barley. Other *Fusarium* species were also present.

Producers will be contacted about the results from their fields to help them to manage for FHB.

- **Cereal Leaf Disease Survey**

Leaf spots were widespread in the province but were generally found at low levels. Tan spot was the most prevalent, but Septoria was also found. Leaf rust was found in 53% of the wheat crops sampled across the province, although in general at low levels (average of about 1%).

Fungicides to control leaf diseases are hit and miss: it is difficult to find consistent results from research and demonstrations. The flag leaf is the most important contributor

to yield. If 5 to 50% of the total leaf area is infected it may justify a fungicide application. If irrigators are taking management precautions to prevent FHB, it should also reduce the severity of leaf diseases.

- **Irrigation Pumping Cost Calculation**

Information was published to enable irrigators to estimate their cost of pumping for any given irrigation application. The numbers can be used for budgeting, for assessing a switch from one fuel source to another or for a feasibility study prior to developing an irrigation project.

The information will enable you to estimate your cost of pumping for your irrigation system.

- **Irrigation Economics and Agronomics Saskatchewan 2006**

Irrigated crop budgets and basic agronomics was updated for 2006 to allow irrigators to plan their crop mix, lenders to make informed decisions, to provide relevant information for irrigation studies and for investment attraction purposes.

Objective 3. Create a public awareness of the economical, social and environmental returns to investment in irrigation.

- **Creating Public Awareness**

- ICDC display was at the Crop Production Show in January as part of Irrigation Alley along with SIPA, irrigation dealers and irrigation-related agri-businesses. The ICDC display was also at the Alberta Irrigation Projects Association Annual Conference, the CSIDC Irrigation Field Day, EnviroForum in Swift Current, the Saskatchewan Cattle Feeders Association Annual Meeting in Saskatoon and several other events as listed under ICDC Technology Transfer.

- ICDC held a joint meeting with SIPA in January to coordinate the irrigation agenda. Both organizations share irrigation promoting as part of their mandates under *The Irrigation Act, 1996*. The website and advertising and promotion are coordinated through a joint SIPA-ICDC committee. SIPA has been the lead agency to monitor SWA's water conservation plan as SIPA has a representative on SWA's Advisory Committee.

- ICDC participated in the Lake Diefenbaker regional tour and barbeque for the Hon Mark Wartman, Minister of Saskatchewan Agriculture and Food.

- SIPA and ICDC participated in the survey that was part of The Brace Institute's National Study on irrigation opportunities, being done for PFRA.

- ICDC lobbied AAFC not to reduce their facilities and research in Saskatchewan. And ICDC is lobbying to put a centre pivot irrigation system on SPARC, Swift Current to demonstrate intensively managed sprinkler irrigation in south west Saskatchewan. ICDC is also continuing to lobby for co-location of SAF staff at CSIDC, Outlook.

- ICDC has lobbied SaskTel for increased access to high-speed internet in rural Saskatchewan as part of its website project.

- Both SIPA & ICDC were sponsors and on the organizing committee of the Saskatchewan Agrivision Corporation Inc's conference in North Battleford in November: Water Mainstream of the Economy. Doug Ball presented the Westside Irrigation project to the 200 attendees.

- Both Carl Siemens, ICDC Chair, and Roger Pederson, SIPA Chair, participated in the Regional Consultation on the Science and Innovation Strategy of AAFC and were able to represent irrigation's interests to this diverse group. The federal agenda is an ambitious one and will require additional funds to implement.

- **ICDC Technology Transfer**

Jan 10-13	Crop Production Week, Saskatoon Irrigation Potential in Saskatchewan, Jan.10th,13th Corn – The Opportunity Crop, Jan.12th
Jan 13	Sask. Alfalfa Seed Producers Association AGM ICDC Pocket Gopher Program
Jan 18	Dekalb Corn College, Regina
Jan 27-29	Saskatchewan Cattle Feeders Association AGM Can Irrigation Support a 10,000 Head Feedlot in Sk.
Feb 3	Saskatchewan Watershed Authority Meeting, Swift Current
Feb 23	Environmental Farm Plan, Irrigation Focus, Outlook
Feb25	University of Saskatchewan Water Forum
Feb 27, 28	Alberta Irrigation Producers Association, Calgary
Mar 4	Southwest Forage Assoc. AGM & SPARC, Swift Current
Mar 16, 17	Agronomy Research and Value Added, Saskatoon
Mar 17	Timothy Crop Insurance Meeting, Outlook
Mar 18	World Water Day – Riverhurst IP feature CKSW interview series
Mar 23	Environmental Farm Plan, Irrigation Focus, Outlook
Apr 17	Pocket Gopher Control, Outlook
Apr 21-22	Enviroforum 2005
June 1	Seeding Trends 2005, Seager Wheeler Farm, The Do's and Don'ts of Growing Corn
Jun 14	Saskatchewan Pest Control Officers Association Annual Meeting Pocket Gopher Control
July 12	Treasure Valley Market Garden Tour, Cadillac
July 14	CSIDC Field Day, Outlook Corn Production
July 18	ICDC Forage Centre Field Day, Osler
July 26	ICDC Forage Centre Field Day, Baildon
Aug 23	Riverhurst Bean Field Walk
Sept 13	Corn, Soybean, Sunflower and Flax Field Day, Outlook
Sept 28	SAF Renewal Conference – Irrigation Program, Elbow
Nov 4	College of Agriculture Career Fair, Saskatoon, display
Nov 4	Agrivision Conference – Water, Mainstream of the Economy, North Battleford
Nov 17	Timothy Production in Saskatchewan 2005, Outlook
Nov 30	Environmental Farm Plans, Riverhurst and Lucky Lake
Dec 5-6	10th Annual ICDC SIPA Irrigation Conference, Swift Current

- **www.irrigationsaskatchewan.com**

ICDC and SIPA have redesigned their joint website. While it still includes crop links and other irrigation links, the redesigned site has many features that the old site did not.

- Free classifieds – irrigation and agricultural – can even include pictures.
- Interactive maps of irrigation development areas and irrigation districts.
- Weekly articles on a wide range of topics.
- Forums on a range of topics
- Q&A section in Irrigation Development
- For Students page
- Advertising for sponsors and irrigation business

What makes this website exciting and unique in the industry is the program behind the website. It allows people who don't know HTML to work on the site. The site consists of pages and modules filled with specific types of information. The end result is that more people can work on the site and it is much easier to keep current and interactive.

- **Acknowledgments and Sponsors**

Co-operating producers

Kelvin Bagshaw
Peter Fehr
Jeff Wiebe
Don Fox
Henry Freisen
Kate Kelk
Greg Sommerfeld
Cypress Colony
Downie Lake Colony
Wheaton Bee Farms
Gerald and Terry Follick
Merle and Robert Larson
Conrad, Roy and Ron Nadeau
Phillip, Ryan and John Enns
Linda and Maurice Metke
Butte Colony
KEG Farms
Roger Pederson
Weiterman Farms Ltd.

Sponsors and Contributors

SAF
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SPARC
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PFRA
Sask. Forage Council
Secan
Proven Seed
Pioneer
Canadian Hay Association
CTV
CKSW
The Western Producer

Partners and Collaborators

CSIDC – Jazeem Wahab, Terry Hogg, Don David, Barry Vestre and Gail Dyck
SCIC – Dale Wotherspoon and Colleen Rooney
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U of S – Bruce Coulman
SAF – Penny Pearse
Monsanto Canada – Rob Ripley and Trevor Herzog
Prairie Seeds – Neil McLeod and Brian Zwaan
Pioneer Hi-bred – Ellis Clayton and Jim Tanner
KEG Agro – Grant Carlson and Murray Nelson
Wheatland Conservation – Bryan Nybo and Darren Steinley
Sask Sunflower Committee
IMCIN/AAFRD
FNITCO
Agri-Biz Communications

ICDC would like to thank all these contributors to irrigation R&D in 2005

LOIS A. JOHNSON, CMA

CERTIFIED MANAGEMENT ACCOUNTANT

P. O. Box 22, R. R. 1
Delisle, Saskatchewan S0L 0P0
Phone: 493-2690 Fax: 493-2688

To: Members of Legislative Assembly
Province of Saskatchewan

I have audited the statement of financial position of the Irrigation Crop Diversification Corporation as at March 31, 2006 and the statement of revenues for the year then ended. These financial statements are the responsibility of the Corporation's management. My responsibility is to express an opinion on these financial statements based on my audit.

I conducted my audit in accordance with generally accepted auditing standards. Those standards require that I plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit also includes examining on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation.

In my opinion, these financial statements present fairly, in all material respects, the financial position of the Corporation as at March 31, 2006 and the results of its operations for the year then ended in accordance with generally accepted accounting principles as applied to non-profit organizations.

Delisle, Saskatchewan
June 12, 2006

Lois A. Johnson CMA

Irrigation Crop Diversification Corporation
Balance Sheet
As at March 31, 2006

ASSETS:	2006	2005
CU Membership	$ 5	$ 5
Cash and Bank	52,984	9,044
Short Term Investments	152,295	149,569
Accounts Receivable	4,165	4,066
	$ 209,449	$ 162,684
LIABILITIES AND MEMBERS' EQUITY:		
GST Payable	$ 3,086	$ 158
Prepaid Member Levies	5,961	
MEMBERS' EQUITY:		
Members' Equity	200,402	162,526
	$ 209,449	$ 162,684

Irrigation Crop Diversification Corporation
Statement of Surplus
As at March 31, 2006

	2006	2005
Opening Balance	$ 162,526	$ 166,589
To write off prior years' uncollectibles	-	(1,778)
From operations	37,876	(2,285)
Ending Balance	$ 200,402	$ 162,526

Irrigation Crop Diversification Corporation
Statement of Revenue and Expenditure
For the year ended March 31, 2006

REVENUE:	2006	2005
Member Levies	$ 29,737	$ 29,692
Non District Levies	32,710	32,710
Crop Management Project Fees	-	2,821
Forage Management Project Fees	47	187
Field Days	-	1,733
Interest	2,726	2,768
Total Revenue	$ 65,220	$ 69,911
EXPENDITURE:		
Field Days	$ 634	$ -
SFC Alfalfa	2,747	
Forage Centres	3,826	7,047
Demos	5,522	4,271
Professional Fees	1,712	615
Crop Research	-	45,595
Timothy Research	5,000	5,000
Forage Management Testing	-	2,898
Insurance	1,575	1,463
Website and Communications	6,215	5,259
Office Expense	113	48
Total Expenditure	$ 27,344	$ 72,196
Net Surplus (Deficit) for the Period	$ 37.876	$ (2,285)

Irrigation Crop Diversification Corporation
Changes in Financial Position
As at March 31, 2006

	2006	2005
Opening Cash	$ 158,617	$ 162,754
From Operations	37,876	(2,285)
Changes in non-cash working capital components:		
(Increase) Decrease in Accounts Receivable	(98)	(412)
Increase in GST Payable	2,928	338
Increase in Prepaid Levies	5,961	
Prior years' adjustment to receivables	-	1,778)
Closing Cash	$ 205,284	$ 158,617

The objects and purposes of ICDC are:

a) to research and demonstrate to producers and irrigation districts profitable agronomic practices for irrigated crops;

b) to develop or assist in developing varieties of crops suitable for irrigated conditions;

c)to develop or assist in developing varieties of crops suitable for irrigated conditions; to provide means to researchers to conduct research into related technology, cropping systems and conservation measures under irrigation and to provide information respecting their research to members irrigation districts and the public;

d) to co-operate with SIPA, the minister and Sask Water Corporation in promoting and developing sustainable irrigation in Saskatchewan.

2. There are no restricted funds in the possession of the Corporation.